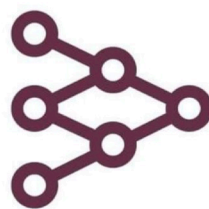




# A Critical Review of Working Animal Welfare Challenges and Access to Veterinary and Technology Services in Oromia, Ethiopia



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# ACKNOWLEDGEMENTS

Dr. Yilkal Kebede from the Ministry of Agriculture kindly supported this project with technical advice. We would also like to thank those who participated in the survey for their time and assistance, which was completed thanks to Galma Halake and Roba Wako, with support from Dr Kasim Guyo, Head of Borena Livestock Office.

The article was expertly reviewed by Professor John Wibberley and Dr Bereket Tsegay, and we are grateful to Amsale Shibeshi and John Livingstone for their administrative roles. The project would not have been possible without generous funding from Elnet Foundation. Any opinions expressed herein are those of the authors alone.

# ABSTRACT

Working animals such as equids, pack-camels and oxen are valuable assets to communities in developing countries, but veterinary care is frequently not available, inadequate, or too expensive, resulting in suboptimal welfare and reduced financial and social security. Given Ethiopia has the largest number of equids in Africa, the objective of this study is to research the deficits in working animal welfare, and access to veterinary and technology services in Borena zone, Oromia, Ethiopia. A branching survey was designed for working animal owners, veterinary staff, and government officials involved in animal welfare policies representing three woredas (districts); Yabello, Teltale and Elewaye. The results revealed 430 participants owned 1655 working animals (671 donkeys, 87 pack-camels and 897 oxen), which are used to support a mean of six people (range 1-16). Of the participants, 90% stated their working animals are important to them, with 77% depending on these animals to earn more than 50% of their total income, yet only 29% are happy with the availability of veterinary services. The most common welfare concerns over the preceding five years are breathing problems (73%), ocular conditions (41%), parasites (40%) and sudden death (30%). Nomadic or semi-nomadic lifestyles were chosen by 33% of participants, and mobile phones with internet access (4%) and banking systems (28%) are still uncommon commodities. This study demonstrates the ongoing importance of working animals in the Borena zone, and a need for increasing resilience by improving veterinary and technology services available for these vulnerable communities.

## KEY WORDS:

Equid; Ethiopia; Pastoralist; Technology; Veterinary; Welfare.



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# INTRODUCTION

Working animals, or “beasts of burden”, are often used to save money that would otherwise be spent on alternative forms of labour or transport in low and middle-income countries (LMICs) (Admassu and Shiferaw, 2011; Alves, 2018). It’s estimated that working equids support 600 million people globally (Valette, 2015) but despite their number, economic importance and vital contribution to draught power (Allan, 2021), working animal welfare is often not given necessary attention due to cultural, economic and political factors (Vessier et al., 2008; Dwyer, 2009; Temesgen, 2020). The most common species used for transport and draught are equids such as horses, mules and donkeys, and bovids, such as oxen and buffaloes (Hu et al., 2020; Mota-Rojas et al., 2020). Pack camels are also considered to be an important working animal, particularly in nomadic communities (Guliye, et al., 2007). Ethiopia has the largest population of equids in Africa (Zekarias and Tesfaye, 2019; Allan, 2021) and the world’s biggest donkey population at 8.7 million (76.9% of the 11.4 million equids in Ethiopia) (FAO, 2021).

Equids can live for approximately 35 years (Fred and Pascal, 2006) but this figure in Ethiopia is nine to thirteen years (Zekarias and Tesfaye, 2019) indicating an urgent need for improvements in health and welfare.



This correlates with findings from previous studies including inadequate feed management (Mekuria and Abebe, 2010; Kumar et al., 2014), poor handling of wounds and injuries, traditional husbandry such as hobbling, and unavailability of veterinary clinics (Gizaw et al., 2021). Furthermore, a recent study demonstrated livestock keepers in crop-livestock and agropastoral systems have more access to veterinary services compared to a pastoral system in Ethiopia (Gizaw et al., 2021), which is supported by information from Ethiopia’s Food and Agricultural Organisation that states the highly pastoral Borena zone only has access to the lowest two grades of veterinary services, with 89% of this zone only having access to the lowest grade for disease surveillance and basic procedures (Food and Agriculture Organisation of the United Nations [FAO], 2021).



To understand working animal welfare from different dimensions and create the foundation of a training programme to improve pastoral community resilience and wellbeing, this study was designed to investigate the socio-economic importance of working animals, common conditions suffered by these animals, and the availability of veterinary and technology services in Borena zone where pastoralism is widely practiced (Degen, 2011). In addition, equids are often excluded from livestock strategic plan and development policies in LMICs (Geiger, 2020) so the results of this study can be used in advocacy programmes for improvements in services provided from key stakeholders such as governments and universities, which has been shown to be an important factor in reducing the prevalence of health and welfare problems for working animals (Stringer et al., 2017).

# METHODOLOGY

## Survey Development

A survey was designed by PENHA and Elnet Foundation to investigate working animal owners' experiences with veterinary and technology services, and welfare concerns for their working animals. Questions included basic demographics then fifteen multiple choice questions with the option to select one or all relevant answers. The survey was divided into two sections – one for working animal owners or handlers, and another for veterinary staff including government officials involved in animal welfare policies to identify their requirements for improving veterinary infrastructure and training.

Questions were designed to identify the number of working animals owned or hired and the type of work they perform, the economic value of these working animals including their contribution to their owner or handler's income, and their access to veterinary and technology services and infrastructure including the impact of the COVID-19 pandemic. The survey also investigated the most common pathological conditions identified in working animals by their owners and handlers over the last five years. Feedback was received from regional staff and government officials prior to distribution, and minor changes were made to ensure the questions were fit for purpose (Appendix 1).

In identifying a research site, the Ethiopian Ministry of Agriculture was consulted and Borena zone of Oromia was selected. Borena is one of twenty zones in the Oromia region, selected due to a range of agriculture and highland topography, with 60-80% pastoral areas in the selected woredas: Yabello, Teltale and Elewaye. The town administration of Yabello was included to represent a variety of environments for the survey.

### Survey Distribution

The survey was voluntary and anonymous, distributed via contacts and local associates from Elnet Foundation so translators were not required. PENHA provided the surveyors with training on ethics and data recording prior to deployment.

Participants were identified at local water points and markets where working animal users often congregate; all owners and handlers over the age of 16 years were invited to participate and incentives were not required. One day was sufficient in each woreda to obtain the target number of responses on paper-based questionnaires in January 2022, which was during a regional drought.

### Data Analysis

Survey responses were tabulated and a graphical format was produced using Microsoft Excel® (a) once the field work was complete. Descriptive statistics were used to analyse the quantitative data, and further analysis was performed using software by STATA® (b).

# RESULTS

## Study Demographic

A total of 430 survey responses were received. Of the participants, 304 (71%) were male and 126 (29%) were female. The median age of participants is 37-40 years, and Teltale has the oldest participant at 85 years old. In addition, women are more likely to be handlers than men (Chart 1), and handlers are significantly more likely to have donkeys than any other species ( $p < 0.05$ ). Participant demographics are summarised in table 1.

Ten participants did not own or hire working animals, including one veterinarian and nine veterinary technicians. The remaining 420 survey results were from people who owned or hired a total of 1655 working animals, which were 897 (54%) oxen, 671 (41%) donkeys and 87 (5%) pack-camels, demonstrated in Table 2. None of the participants worked with horses or mules. The majority of participants (87%) were from a rural area; only Yabello had participants from an urban setting (38%). Furthermore, the results show that of the 10 veterinary staff interviewed, 80% of them were located in a town.

Nomadic or semi-nomadic lifestyles were chosen by 33% of participants, with the highest number of nomadic participants Yabello (7%). Semi-nomadic people were found to be the demographic with the highest number of every species of working animals, and those in a fixed location have the least (Table 3).







## Economic Value of Working Animals

Working animals support an average of six people (range 1-16, standard deviation 2.55) within the study population. Of the participants, 90% stated their working animals are important to them, with 77% depending on these animals to earn more than 50% of their total income, this is significantly higher in Teltale (92%) and Elewaye (84%) compared to Yabello (55%) ( $p < 0.05$ ).

The number of animals performing each type of work is shown in table 4. Of the participants, 80% depend on their working animals to collect water, and collecting firewood was reported by 17% of participants, which is highest in Teltale (35%) and Yabello (15.5%) but significantly less ( $p < 0.05$ ) in Elewaye (3%). Yabello has a significantly higher number of working animals used for transporting building materials (15.5%) compared to the other two woredas (Teltale 3%, Elewaye 0.7%) ( $p < 0.05$ ). Of the 22 animals used for transporting building materials in Yabello, 45% were in the town and 55% were in a rural environment.

## Veterinary Services

Only 29% of participants reported being happy with the availability of veterinary services; 51% can't reach a fixed veterinary clinic within one day, and 27% take between one day to one week to reach a veterinary clinic. Participants from Yabello have the highest level of dissatisfaction (80%) with the availability of veterinary services.

All three woredas have a visiting mobile clinic, but the majority (42%) visit less than once a month. In addition, approximately half (47%) take between one day to one week to reach an agrovet or pharmacy. However, the majority of participants can reach a community animal health worker (CAHW) within one week (73%), with 24% reporting this is possible within one day. The number of participants and access to different types of veterinary services are shown in table 5.

Of the participants with access to fixed veterinary clinics, the highest numbers were reported by those living in a fixed location with 60% able to reach a veterinary clinic within two hours. Nomadic participants all have to

reach a fixed veterinary clinic and only have infrequent mobile clinics (table 6).

The majority of participants (70%) stated the COVID-19 pandemic has not impacted their access to veterinary services, with the highest impact in Teltale where only 50% responded positively.

### **Working Animal Welfare**

The most common pathological conditions detected by working animal owners and handlers were breathing problems (73%), ocular conditions (41%), parasites (40%) and sudden death (30%) as shown in chart 2. There were 314 reports of breathing problems in working animals across the three woredas, 41% of these cases occurred in Yabello, whereas sudden death is less common in this woreda with only 9% of participants reporting this problem. There were 128 reports of sudden death in working animals over the previous five years, 78% of these were reported by participants working with donkeys. The donkey skin trade was also reported as a problem by 15 participants, of which, 60% were in Yabello.

In response to being questioned if they are concerned about the welfare of their working animals, the majority of participants responded yes (82%), with only 8% giving a negative response. The highest positive response rate was 89% in Teltale.

The study included 10 veterinary staff, of which 100% were concerned with the lack of sufficient medications, and 80% responded that they needed more training about working animals. Training is

mainly required in the topics of foot care (100%) and working animal welfare (80%), but all areas of training requirement received a high response rate.

### **Technology Services and Infrastructure**

The survey was performed during a regional drought (January 2022), yet only one participant had a map to find water points, and none had a map to find grazing areas. Mobile phones with internet access (4%) and banking systems (28%) are still uncommon commodities, shown in table 7.

Traditional meteorological rain forecast (61%) and mobile phone without internet access (57%) were the types of technology with the highest availability reported. Of the participants with internet access on their phones, the majority are in Yabello (83%). Hence, pastoralist associations, internet banking, and modern scientific rain forecasts are rare, especially in Teltale and Elewaye.

Yabello is the woreda with the highest level of access to all technology services with the exception of a traditional meteorological rain forecast, which is highest in Teltale. Chart 3 shows the availability of technology services in each woreda.

The greatest infrastructure challenges were found to be a lack of an easily accessible secondary school (75%), and lack of easily accessible markets (72%). The total challenges were significantly less ( $p < 0.05$ ) in Yabello (23%) compared to Teltale (40%) and Elewaye (37%), shown in chart 4.



# DISCUSSION

Borena zone is a pastoralist area within the Oromia region of Ethiopia with approximately 500,000 people living in the zone's 13 woredas, the largest of which is Yabello with over 110,000 people. Livestock are an important commodity for the Borena community, with nearly 1.5 million cattle, 2,222 horses, 5525 mules, 68,799 donkeys and 185,382 camels cohabiting this zone (Fentahun and Fentahun, 2020). This study surveyed a small population of people working with animals in Borena zone (n = 430) including about their experiences with veterinary and technology services and infrastructure, and their attitudes and knowledge about working animal welfare. The aim of the study was to identify areas of weakness or gaps in the services available to this community, including problems with working animal welfare.

These results can be used to develop multiple livelihood improvement focused instruments such as more technology and community training programmes to improve knowledge and resilience for working animal owners.

There was a high response rate of the survey that represents the enthusiasm in the community to contribute to science, and their desire for improvements to be made regarding these services and working animal welfare.

The results highlight many challenges in the region, particularly for nomadic and semi-nomadic people who have less access to the services and infrastructure investigated with this survey despite having a higher number of working animals than those in a fixed location.

## Study Demographic

The majority of participants (75-82%) own their working animals in all three woredas, so the remaining 18-25% hire or borrow them to earn money. Geiger (2020) highlights how the community benefits as a whole when there are working animals; owners will support those in difficulty by lending their animals or charging a small fee to help them out of poverty. This survey identified that donkeys were the species most used by non-owners (handlers), who are more likely to be women. This is consistent with results by Balehey et al., (2018) reporting that women have less livestock than men in pastoralist communities. Donkeys are known to help women by providing social status, empowerment, reduced transport burden, and a sense of companionship (Admassu and Shiferaw, 2011; Geiger, 2020).

This emphasises the importance of ensuring the health and longevity of working animals to enable women to obtain more independence and a career, and for children to gain an education rather than helping with daily chores that can be completed quickly with a working animal.

Oxen are the most common type of working animal (54%), consistent with the tradition of people in Borena to rear cattle (Degen, 2011). Teltale is the woreda with the least working animals but the most working animal owners, which could indicate a higher degree of poverty in this pastoralist area as working animals have been shown to be a financial asset in rural areas (Admassu and Shiferaw, 2011). The lowest proportion of working animal owners is in the more urban woreda of Yabello, which could be due to more wealthy tradesmen hiring poorer people in the town that hire or borrow animals for making an income with their labour.



Semi-nomadic people were found to have the highest number of every species of working animals per participant. The majority of participants have a fixed lifestyle (67.1%), which is consistent with a report that describes a reluctant lifestyle transformation of Borena people from nomadic pastoralism to agro-pastoralism following a government policy that encourages sedenterisation (Degen, 2011).

### **Economic Value of Working Animals**

Working animals are relied upon to earn more than half of the income for the majority of participants (77%), which is significantly more in the more rural woredas of Teltale and Elewaye compared to Yabello, where 38% of participants were interviewed in the town. In addition, the income raised by labour performed by working animals is required to support up to 16 people, which supports data from previous studies (Admassu and Shiferaw, 2011; Stringer et al., 2017; Alves, 2018; Alan, 2021) that demonstrate how working animals provide an important financial contribution to communities in low to middle income countries by saving money that would otherwise have been spent on other forms of transport or labour. The lower financial input in Yabello could be due to other job opportunities in the town, but 55% of participants in this woreda were still reliant on their working animals for more than 50% of their income, indicating that working animals are still an important resource in urban environments.

Collecting water was one of the most frequent tasks performed by working animals, second only to ploughing due to the large number of draft-oxen that are used by the participants. Water collection is a role commonly perform-

ed by women and children (Rahman and Reed, 2014; Goodrum et al., 2022), thereby concluding that working animals provide a vital social role to allow other activities such as children attending school, and women developing a career. Firewood collection was identified as important for 17% of participants, the majority of which were in Teltale and Yabello. It is not known why only 3% of participants in Elewaye use their working animals for this role, this could be due to a higher availability of firewood or alternative methods of collection but further research is required in this area.

The only urban area to be surveyed was Yabello, so this could explain why there are significantly more working animals used for transporting building materials in this woreda. However, 55% of the working animals used for this purpose in Yabello were in a rural area, highlighting the importance of working animals for transport in areas where the road quality is often poor (Rahman and Reed, 2014).

### **Veterinary Services**

The quality of animal health care systems is determined by accessibility, availability and affordability, with significant differences identified across livestock production systems, geographic locations, socioeconomic strata and service providers in Ethiopia (Gizaw et al., 2021). Evidence shows a positive correlation between the livelihood of poor pastoralists and access to these services (Stringer, 2014). This study aimed to record the veterinary services available for communities living nomadic, semi-nomadic or fixed lifestyles in the Borena zone.

The results revealed that more than half of the participants (51%) are unable to reach a veterinary clinic within one day. There is a significant deficit for those living a nomadic lifestyle, 75% of whom need up to one week to access a fixed veterinary clinic or pharmacy, and 83% only have access to irregular mobile clinics (>monthly). Furthermore, only 49% of all participants are able to reach a veterinary clinic within two hours, and the majority of these people live in a fixed location. These findings provide evidence that veterinary services need to be further developed with specific attention to pastoral communities to ensure the sustainability and resilience of this traditional lifestyle.

The interviews were conducted in pastoralist woredas, so only 13% of participants were located in the urban area of Yabello. However, of the 10 veterinary staff included in the survey, only 20% were in the rural area, showing a disparity between requirement and delivery of veterinary services.

Community animal health workers (CAHWs) play an important role in providing veterinary services; indeed, this is the only veterinary service available within one day for nomadic survey participants (17%). These paraprofessionals have been shown to be effective at providing clinical services and vaccinations, parasite control and disease surveillance, particularly in remote pastoral regions of Ethiopia (Gizaw et al., 2021). This study emphasises the importance of providing CAHWs with appropriate training and support to ensure a high-quality service is available for all working animals.



Despite COVID-19 pandemic society-wide adverse socio-economic impacts, it only impacted less than one third of the study population's ability to access veterinary services. The highest impact was 50% in Teltale, so further studies would be beneficial to identify how this woreda, as well as other woredas with similar socio-economic systems, could develop resilience against future pandemics and natural disasters.

### **Working Animal Welfare**

Previous studies have shown the welfare of working equids in developing countries to be lacking due to poor nutrition and harnessing, inappropriate management and work practices, injury and disease, including preventable infectious diseases (Rahman and Reed, 2014;



Stringer et al., 2017; Temesgen et al., 2020). Many of these problems can be attributed to economic factors, but this study aimed to identify medical conditions that could be prevented with improved community training and veterinary services.

Breathing problems were reported as the most common condition suffered by working animals (73%), which was also recently reported as a common problem in central Ethiopia (Stringer et al., 2017). Of these cases, 41% were identified in Yabello, so may be related to the duration these animals spend in dusty urban environments. Further research is required to identify what type of respiratory conditions are most common to develop guidance on the most appropriate type of environmental management and what medical training is required.

Parasites were also reported as a common problem (40%), which are likely to be preventable with appropriate training and access to veterinary services.

All three woredas reported cases of sudden death without previous symptoms, particularly in donkeys that are notoriously stoical so early clinical signs of disease are difficult to detect. This indicates that community training about how donkeys present with various clinical conditions would improve their welfare and chances of survival.

The donkey skin trade provides Ejiao for traditional Chinese medicine, and has heavily contributed to a dramatic decline in the global donkey population with multiple donkey abattoirs opening in East Africa since 2016 (Goodrum et al., 2022). The resulting challenges include inflated prices that make donkeys unaffordable for many pastoralists, and donkey thefts as they become more valuable. This study identified the majority of concerns regarding this trade were from participants in Yabello (60%), possibly due to its location on the popular trade route to Kenya where there have been active donkey abattoirs for most of the preceding five years. This highlights the importance of providing guidance and support for how to protect donkeys and respond to these challenges in this area.

Veterinary staff identified infrastructure concerns primarily as the lack of sufficient medication (100%), and 80% confirmed a need for more training about working animals with a focus on foot care and working animal welfare. This study highlights the importance of improving teaching and training for veterinary staff on all aspects of working animal veterinary science from infectious diseases to appropriate harnessing methods.

## Technology Services and Infrastructure

This data shows 57% of participants use mobile phones and only 5.7% have internet access, so there is a potential to improve livelihoods with more access to these services because technological intervention has shown to increase income via better communication, improved herd management with more access to helpful resources, decreased conflict, and improved human health care. It also enables improved demographic surveillance, and female empowerment by social change in pastoral communities (Parlasca, 2021).

Despite an encouraging development of the Ethiopian financial sector including internet banking and modern insurance policies, these have been found to be unsuitable for pastoralists with livestock as their most precious assets (Ambachew et al., 2017). This is consistent with the results from this survey; banking systems were found to be uncommon with the highest level of access in those with a fixed lifestyle (29.2%).

Traditional rain forecasting is preferred to modern scientific data by participants of this study, which could be influenced by the lack of access to radio, mobile phones and TV for many of them. However, Borena people are known for using indigenous knowledge such as Gada (Ta'a, 2016), so are still heavily reliant on traditional techniques.

Positive correlation between urbanisation and introduction of modern technologies is observed with lowest access to pastoralist associations, internet banking, and modern scientific rain forecasts in the rural woredas,

Teltale and Elewaye. Yabello is the only woreda in the survey that included an urban area, which coincides with the highest level of access to internet on mobile phones. In contrast, use of traditional meteorological rain forecast is highest in Teltale as shows in Chart 3.

The most common challenge associated with technology infrastructure identified in this survey is educational accessibility, which may be due to the prioritisation of owning livestock over education - pastoralists view livestock ownership as the very self of community (Boru, 2020). This data also identified a challenge associated with the lack of easily accessible markets, which is already known to be prevalent for the pastoralist community (Abduletif, 2019).

## Further Research

The recruitment method of approaching people with working animals around local water points is a limitation for the study; veterinary staff, people living more remotely and those with a nomadic lifestyle may have been under-represented, so future studies should focus on methods of reaching these people as the results suggest nomadic communities are more vulnerable. The results can be generalised for other woredas within Borena zone and other parts of Ethiopia with similar topography and population, but regions with more towns and land used for growing crops are likely to show different results. In addition, the survey was completed in a period of regional drought, which may have impacted the number and type of visitors to local water points. Further studies during different times of the year are required to rule out bias from seasonal impact.



Prices and affordability of veterinary and technology services were beyond the scope of this survey, so further investigations could identify the impact these factors would have on uptake if availability was improved. Social studies would be beneficial to understand more about why certain services are not already used such as internet, modern weather forecasts and banking systems.

Further research is also required to identify the type of respiratory conditions and parasites that are prevalent in the region such as African horse sickness, Equine herpesvirus, gastrointestinal nematodes and ectoparasites – these common problems will have an impact on the welfare and longevity of working animals, and are likely to result in financial losses for their owners. Studies should focus on collecting information for developing guidance on the most appropriate environmental management and medical training for these conditions.





# CONCLUSION

In conclusion, this study demonstrates the ongoing importance of working animals in Borena zone, and a need for increasing resilience by improving veterinary and technology services and infrastructure available for these vulnerable communities. The inform-

ation gathered during this participatory study with owners and handlers may be used to inform future veterinary and educational programme interventions, including training for CAHWs about working animal welfare, and veterinarians about working animal diseases



and routine procedures such as social studies and understanding of the significance of introducing more technology to the region.

An additional output from this study is a contribution to the growing evidence that working animals must be recognised as valuable

assets with a collaboration between key stakeholders including government departments, policy-makers, universities and non-governmental organisations, which is pivotal for improving their health and welfare.

# APPENDIX

## ABBREVIATIONS

COVID-19	Coronavirus Disease 2019
CAHW	Community Animal Health Worker
DST	Donkey Skin Trade
FAO	The Food and Agriculture Organization of the United Nations
LMIC	Low and Middle Income Countries
RTA	Road Traffic Accident
PENHA	Pastoral and Environmental Network in the Horn of Africa
SD	Standard Deviation
TV	Television

## NOTES

- a. a. Microsoft Corporation, 2018. Microsoft Excel, Available at: <https://office.microsoft.com/excel>.
- b. b. StataCorp, 2021. Stata Statistical Software: Release 17. College Station, TX: StataCorp LLC.

## CONFLICT OF INTEREST:

The authors declare they have no conflicts of interest.

## REFERENCES:

- Abduletif, A., 2019. Benefits and challenges of pastoralism system in Ethiopia. *Studia Mundi Economica*, 6(3), 56-67.
- Admassu, B. and Shiferaw, Y., 2011. Donkeys, horses and mules - their contribution to people's livelihoods in Ethiopia. In: *The Brooke, Addis Ababa, Ethiopia*, Pp 9-10.
- Allan, F.K., 2021. A Landscaping Analysis of Working Equid Population Numbers in LMICs, with Policy Recommendations. In: *The Brooke Report*, Pp 10-22.
- Alves, R.R.N., 2018. Ethnozoology: Animals in our lives. In: *The Ethnozoological Role of Working Animals in Traction and Transport*, Academic Press, London, UK. Pp 339-349.
- Ambachew, A., Mamo, K. and Mohammed, J., 2017. Inclusive Financial Services in Pastoral Areas of Southern Oromia, Afar, And Ethiopian Somali Regions: Opportunities, Implementation Challenges, And Prospects. In: *Proceeding of Research for Enhancing Pastoralists Livelihood Through Resilience and Market Expansion*. Pp 131-150.
- Balehey, S., Tesfay, G. and Balehegn, M., 2018. Traditional gender inequalities limit pastoral women's opportunities for adaptation to climate change: Evidence from the Afar pastoralists of Ethiopia. *Pastoralism: Research, Policy and Practice*, 8(23), 1-14.
- Boru, A.K., 2020. Education for Borena pastoralist community children in Ethiopia: practices and challenges. *Ethiopian Journal of Education and Sciences*, 15(2), 19-32.
- Degen, A. A., 2011. Transformation of Borana from nomadic pastoralists to agropastoralists and shift of livestock from cattle to include e more goats, camels and sheep in Southern Ethiopia. *International Journal of Business and Globalisation*, 6(3/4), 292-312.
- Dwyer, C.M., 2009. Welfare of sheep: Providing for welfare in an extensive environment. *Small Ruminant Research*, 86, 14-21.
- Fenetahun Y. and Fenetahun, T., 2020. Socio-economic profile of arid and semi-arid agropastoral region of Borana rangeland Southern, Ethiopia. *MOJ Ecology and Environmental Science*, 5(3), 113-122.
- Food and Agriculture Organization of the United Nations (FAO), 2021. *FAOSTAT Livestock Primary Metadata*, 17 Feb 2021. <http://www.fao.org/faostat/en/#country/238>.
- Fred, O. and Pascal, K., 2006. Extension Approaches to improving the welfare of working equines. *Kenya Network for Dissemination of Agricultural Technologies (KENDAT)*, 1-28.
- Geiger, M., Hockenhull, J., Buller, H., Engida, G. T., Getachew, M., Burden, F. A. and Whay, H. R., 2020. Understanding the attitudes of communities to the social, economic, and cultural importance of working donkeys in rural, peri-urban, and urban areas of Ethiopia. *Frontiers Veterinary Science*, 7, 60.
- Gizaw, S., Woldehanna, M., Anteneh, H., Ayledo, G., Awol, F., Gebreyohannes, G., Gebremedhin, B. and Wieland, B., 2021. Animal health service delivery in crop-livestock and pastoral systems

in Ethiopia. *Frontiers in Veterinary Science*, 8.

Goodrum, F., Theuri, S., Mutua, E. and Carder, G., 2022. The donkey skin trade: Challenges and opportunities for policy change. *Global Policy* 13(2), 304-309.

Guliye, A.Y., Noor, I.M., Bebe, B.O. and Kosgey, I.S., 2007. Role of camels (*Camelus dromedarius*) in the traditional lifestyle of Somali pastoralists in Northern Kenya. *Outlook on Agriculture* 36 (1), 29-34.

Kumar, N., Fisseha, K. K., Shishay, N. and Hagos, Y., 2014. Welfare assessment of working donkeys in Mekelle City, Ethiopia. *Global Veterinaria*, 12(3), 314-319.

Luna, D. and Tadich, T. A., 2019. Why should human-animal interactions be included in research of working equids' welfare? *Animals (Basel)*, 9(2), 42.

Mekuria, S. and Abebe, R., 2010. Observation on major welfare problems of equine in Meskan district, Southern Ethiopia. *Livestock Research for Rural Development*, 22(3), 1-16.

Mota-Rojas, D., Braghieri, A., Álvarez-Macías, A., Serrapica, F., Ramírez-Bribiesca, E., Cruz-Monteros, R., Masucci, F., Mora-Medina, P. and Napolitano, F., 2021. The use of draught animals in rural labour. *Animals*, 11(9), 2683.

Parlasca, M. C., 2021. A vital technology: Review of the literature on mobile phone use among pastoralists. *Journal of International Development*, 33(4), 780-799.

Rahman, S. A. and Reed, K., 2014. The management and welfare of working animals: Identifying problems, seeking solutions and anticipating the future. *Revue Scientifique et Technique OIE*, 33(1), 197-202.

Stringer, A. P., 2014. Infectious diseases of working equids. *Veterinary Clinics of North America: Equine Practice*, 20(3), 695-718.

Stringer, A. P., Christley, R. M., Bell, C. E., Gebreab, F., Tefera, G., Reed, K., Trawford, A. and Pinchbeck, G. L., 2017. Owner reported diseases of working equids in central Ethiopia. *Equine Veterinary Journal* 49(4), 501-6.

Ta'a, T., 2016. The Gadaa system and some of its institutions among the Booranaa: a historical perspective. *Ethiopian Journal of the Social Sciences and Humanities*, 12(2), 81-97.

Temesgen Z., Ashebo, A. and Tantas, T., 2020. General status of animal welfare in developing countries: African context-review. *Global Veterinaria*, 22(2), 110-120.

Valette, D., 2015. Working equine animal population In: *Invisible Workers*, Brooke, London, UK. Pp 10-15.

Vessier, I., Butterworth, A., Bock, B. and Roe, E., 2008. European approaches to ensure good animal welfare. *Journal of Applied Animal Behaviour Science*, 113(4), 279-297.

Zekarias, T. and Tesfaye, S., 2019. The welfare issues of working equine in Ethiopia: A review. *European Journal of Biological Sciences*, 11(3), 82-90.

## TABLES AND CHARTS

**Table 1: Participant demographics**

	Yabello	Teltale	Elewaye	Total
<b>Location</b>				
Town	57 (38%)	0	0	57 (13%)
Rural	93 (62%)	131 (100%)	149 (100%)	373 (87%)
<b>Age</b>				
Range	18-79	16-85	17-75	
Mean (SD)	40 (14)	37 (15)	36 (14)	37.45 (14)
Median	37	33	33	
<b>Gender</b>				
Male	108 (72%)	89 (68%)	107 (72%)	304 (71%)
Female	42 (28%)	42 (32%)	42 (28%)	126 (29%)
<b>Dependants</b>				
Range	1-15	2-12	1-16	1-16
Median	6	6	6	6
<b>Lifestyle</b>				
Nomadic	1 (7%)	1 (0.77%)	1 (0.67%)	12 (2.9%)
Semi-nomadic	58 (41%)	28 (22%)	40 (27%)	126 (30%)
Fixed location	74 (52%)	101 (78%)	107 (72%)	282 (67.1%)
<b>Total</b>	<b>150</b>	<b>131</b>	<b>149</b>	<b>430</b>

\*SD = Standard Deviation

**Table 2: Number of working animals per participant**

	Yabello	Teltale	Elewaye	TOTAL
<b>Horses</b>	0	0	0	0
<b>Donkeys</b>	Number	197	199	671 (41%)
	Mean (*SD)	1.7 (1.3)	1.9 (1.15)	2.4 (1.63)
	Median	3	2	2
	Range	0-10	0-6	0-10
	Participants	115	107	115
<b>Mules</b>	0	0	0	0
<b>Pack camels</b>	Number	33	12	42 (5%)
	Mean (*SD)	3 (0.9)	4 (0.6)	3.2 (1.02)
	Median	3	4	3
	Range	0-7	0-4	0-7
	Participants	11	3	13
<b>Working oxen</b>	Number	306	283	308 (54%)

	Yabello	Teltale	Elewaye	TOTAL
Mean (*SD)	2.6 (1.62)	2.5 (1.49)	2.7 (1.82)	
Median	2	2	2	
Range	0-6	0-8	0-8	
Participants	117	113	116	
None	8	1	1	10

\*SD = Standard Deviation

**Table 3:** Species used by participant lifestyle

	Nomadic (1)	Semi-no- madic (2)	Fixed (3)	(1) vs. (2)	(1) vs. (3)	(2) vs. (3)
Number of Participants	12	126	282	138	294	408
Number of Working Animals	43	604	1008	647	1051	1612
Number of working animals per participant (mean)	3.583	4.794	3.574	1.210	0.009	1.219*
Standard Error	(0.468)	(0.266)	(0.137)	(0.876)	(0.671)	(0.271)

\*p value <0.05

**Table 4:** Number of working animals performing each type of work in the study areas

TYPE OF WORK	Yabello	Teltale	Elewaye	TOTAL
Carrying goods to or from a market	48 (34%)	89 (68%)	64 (43%)	201 (48%)
Collecting firewood	22 (15.5%)	46 (35%)	5 (3%)	73 (17%)
Collecting water	115 (81%)	107 (82%)	115 (78%)	337 (80%)
Transporting people	0	0	1 (0.07%)	1 (0.2%)
Transporting build- ing materials	22 (15.5%)	4 (3%)	1 (0.07%)	27 (6%)
Ploughing	118 (83%)	111 (85%)	113 (76%)	342 (81%)
Other	0	0	0	0
<b>TOTAL</b>				<b>981</b>



**Table 5:** Number of participants with access to each type of veterinary service in the study area

	Yabello	Teltale	Elewaye	TOTAL
<b>A fixed veterinary clinic that you can get to</b>				
i. within two hours	72	62	72	206 (49%)
ii. within one day	40	23	39	102 (24%)
iii. within one week	30	46	39	115 (27%)
<b>A mobile veterinary clinic that</b>				
i. visits weekly	1	1	2	4(1%)
ii. visits monthly	5	10	5	20 (5%)
iii. visits less than once a month (no fixed time)	66	46	66	178 (42%)
<b>A pharmacy or agrovet store for medications that you can get to</b>				
i. within one day	64	64	90	218 (52%)
ii. within one week	76	65	58	199 (47%)
<b>A Community Animal Health Worker (CAHW)</b>				
i. within one day	30	14	56	100 (24%)
ii. within one week	78	65	62	205 (49%)
iii. always available	4	9	4	17 (4%)
None	0	0	0	0
Depends on location	0	0	2	2 (0.05%)

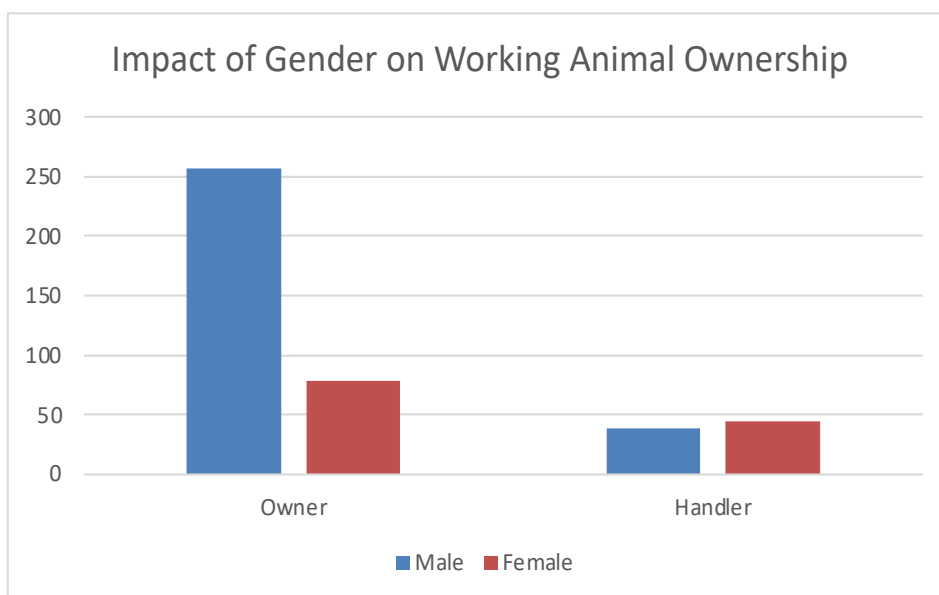
**Table 6:** Number of participants from different lifestyles and their access to veterinary services

	Nomadic (12)	Semi-nomadic (125)	Fixed (282)
Fixed Clinic in 2 hours	0	38 (30%)	168 (60%)
Fixed Clinic in 1 day	3 (25%)	36 (29%)	62 (22%)
Fixed Clinic 1 week	9 (75%)	53 (42%)	53 (19%)
Mobile Clinic weekly	0	2 (2%)	2 (1%)
Mobile Clinic monthly	1 (8)	10 (8%)	9 (3%)
Mobile Clinic >1 month	10 (83%)	70 (56%)	97 (34%)
Pharmacy in 1 day	3 (25%)	45 (36%)	169 (60%)
Pharmacy in 1 week	9 (75%)	79 (63%)	111 (39%)
CAHW in 1 day	2 (17%)	19 (15%)	78 (28%)
CAHW in 1 week	8 (67%)	74 (59%)	123 (44%)
CAHW always available	0	9 (7%)	9 (3%)
Depends on location	0	2 (2%)	2 (1%)

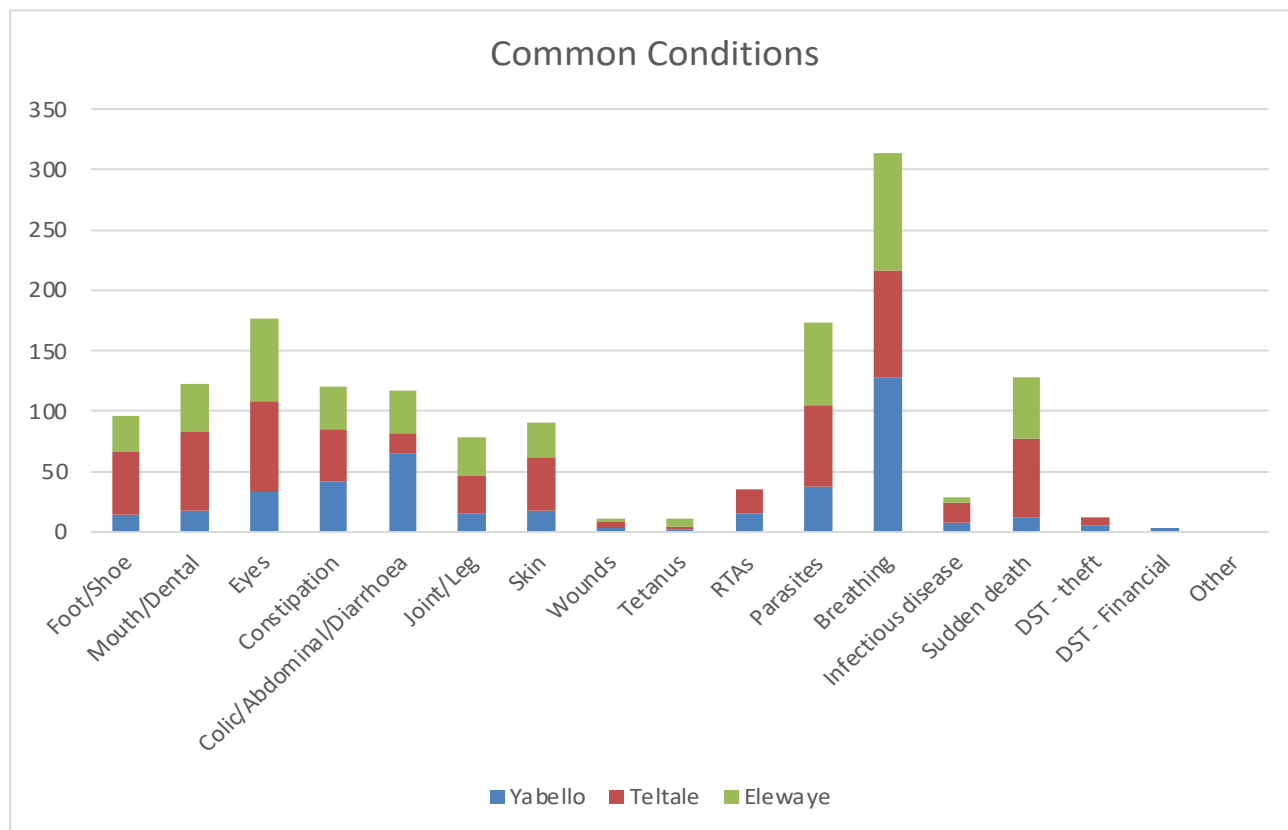
**Table 7: Availability of types of technology by participants' lifestyle**

Type of Technology	Nomadic	Mixed	Fixed	TOTAL
Mobile phone without internet access	6 (50%)	78 (61.9%)	156 (55.31%)	240 (57%)
Mobile phone with internet access	1 (8.3%)	3 (2.3%)	5 (1.7%)	9 (5.7%)
Television	0	3 (2.3%)	6 (2.2%)	9 (2.1%)
Radio	0	30 (23.8%)	76 (26.9%)	106 (25.4%)
Banking system	2 (16.6)	26 (20.6%)	83 (29.2%)	111(26.4%)
Internet banking	0	2 (1.5%)	1 (0.3%)	3 (0.7%)
Maps to find water points	0	1 (0.7%)	0	1 (0.2%)
Maps to find grazing pasture	0	0	0	0
Pastoralist association or similar	0	14 (11%)	8 (2.8 %)	22 (5.2%)
Traditional rain forecast	9 (75%)	83 (55%)	165 (68%)	257 (61.2%)
Modern scientific rain forecast	0	2 (1.5%)	4 (1.4%)	6 (1.4%)
<b>Total Participants</b>	<b>12</b>	<b>126</b>	<b>282</b>	<b>420</b>

**Chart 1: Impact of gender on working animal ownership**

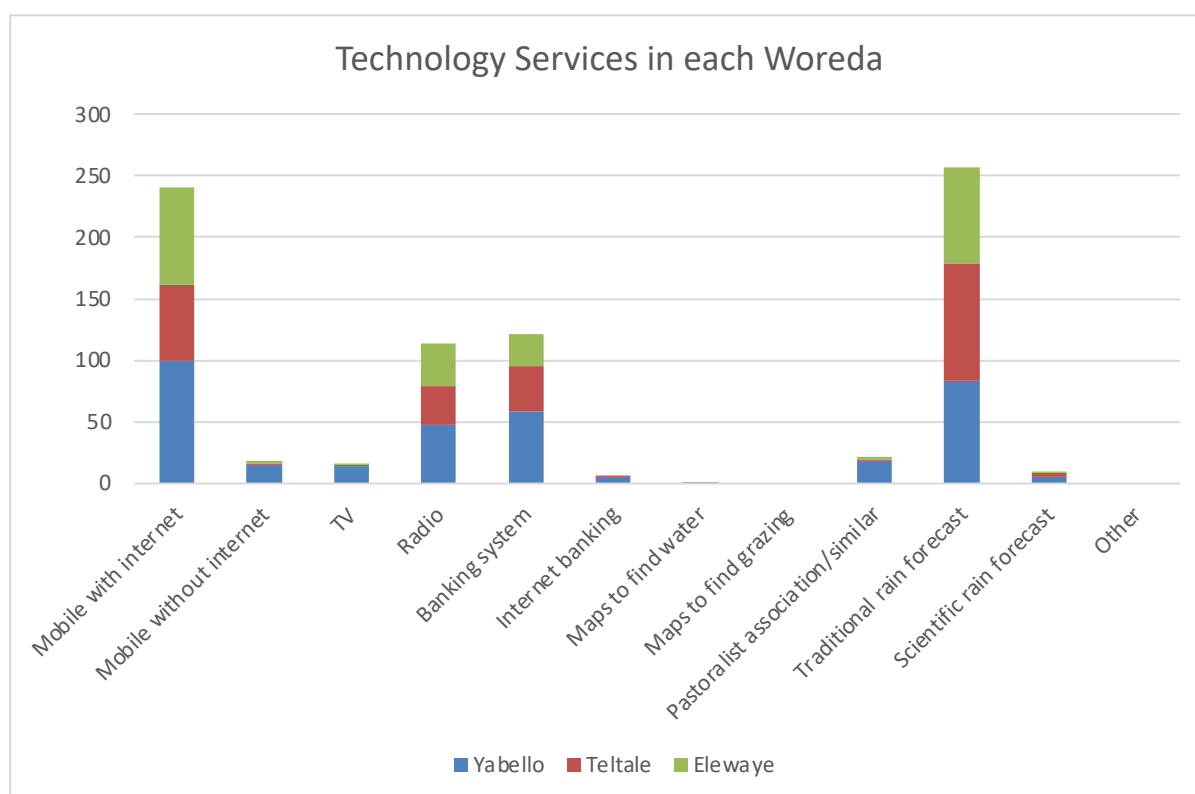


**Chart 2:** Common conditions reported in working animals by their owners or handlers over the preceding five years in Borena zone.

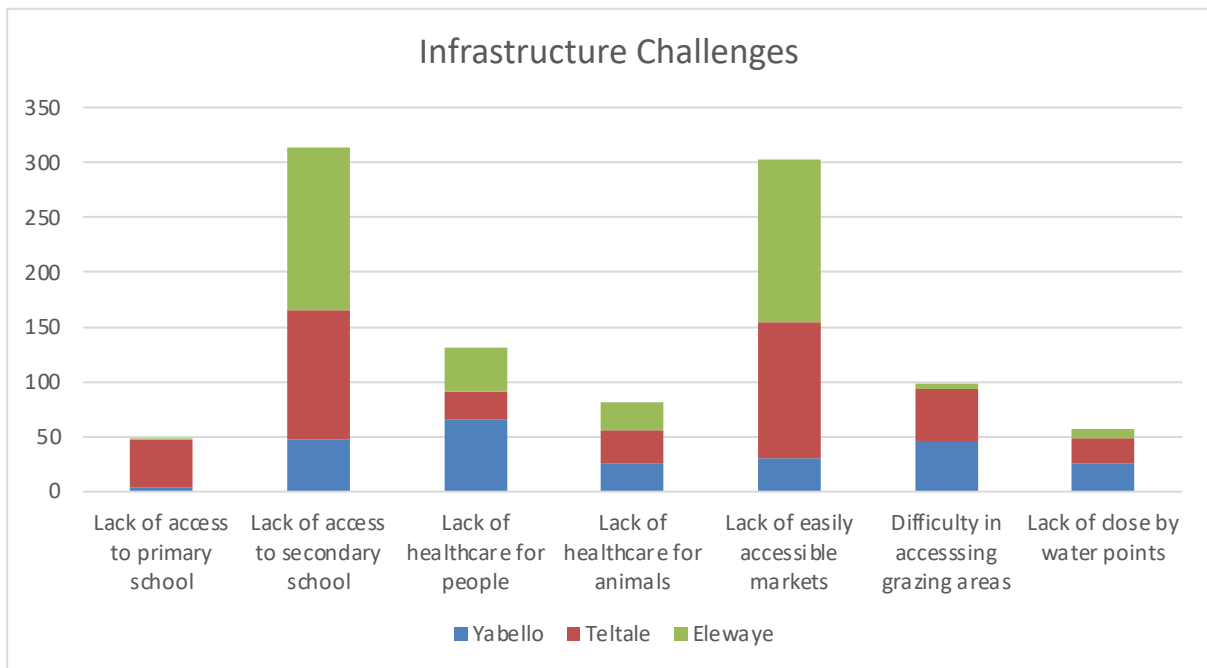


RTA = Road Traffic Accidents. DST = Donkey Skin Trade.

**Chart 3:** Technology services available for working animal owners in Borena zone



**Chart 4: Infrastructure challenges reported by working animal owners in Borena zone**



**PENHA – Elnet Foundation Survey**

**Participant ID** \_\_\_\_\_ **Location:** Yabelo / Teltale / Elewaye **Environment:** Town / Rural

**Age of person** (must be over 16): \_\_\_\_\_ **Gender:** Male / Female

**Number of people supported by your working animal(s)** \_\_\_\_\_

1. What is your role with working animals? (Please select all correct options)
  - a. Owner
  - b. Handler
  - c. Veterinarian
  - d. Veterinary Technician
  - e. Veterinary Student
  - f. Non-veterinary government official involved in animal welfare policies
2. How many working animals do you own or hire? (Please give a number for every option)
  - a. Horses:
  - b. Donkeys:
  - c. Mules:
  - d. Pack Camels
  - e. Working Oxen e.g. Ploughing/Carts
  - f. None – \*SKIP AHEAD TO Q11\*
3. What is your lifestyle? (Please select ONE answer)
  - a. Nomadic
  - b. Semi-nomadic
  - c. Fixed location all year
4. How much of your income is made from using your working animals? (Please select ONE answer)
  - a. 100%
  - b. 75-99%
  - c. 50-75%
  - d. 25-50%
  - e. 0-25%
5. What type of work do your animals perform? (Please select all correct options)
  - a. Carrying goods to or from a market
  - b. Collecting firewood
  - c. Collecting water
  - d. Transporting people
  - e. Carrying building materials e.g. sand or bricks
  - f. Ploughing
  - g. Other – please specify:.....
6. Which veterinary services for working animals are available to you? (Select all that apply)
  - a. A fixed veterinary clinic that you can get to...
    - i. within two hours
    - ii. within one day
    - iii. within one week
  - b. A mobile veterinary clinic that...
    - i. visits weekly
    - ii. visits monthly
    - iii. visits less than once a month (no fixed time)

- c. A pharmacy or agroveter store for medications that you can get to...
  - i. within one day
  - ii. within one week
- d. A Community Animal Health Worker (CAHW)
  - i. within one day
  - ii. within one week
  - iii. always available
- e. None
- f. Depends on location – please give examples:.....

**For questions 7-10, please select one option from 1-5 where:**

**1 = Definitely no, 2 = Slightly no, 3 = Indifferent, 4 = Slightly yes, 5 = Definitely yes**

7. Are you happy with the current availability of veterinary services for your working animals?

1                      2                      3                      4                      5

8. Has COVID-19 reduced your access to veterinary services?

1                      2                      3                      4                      5

9. Are your working animals important to you?

1                      2                      3                      4                      5

10. Are you worried about the welfare or wellbeing of working animals?

1                      2                      3                      4                      5

11. Which type of technology do you have access to? (Please select all that apply)

- |   |   |
|---|---|
| a. Mobile phone without internet access | g. Maps to find water points                |
| b. Mobile phone with internet access    | h. Maps to find grazing pasture             |
| c. TV                                   | i. Pastoralist association or similar       |
| d. Radio                                | j. Traditional meteorological rain forecast |
| e. Banking system                       | k. Modern scientific rain forecast          |
| f. Internet banking                     | l. Other – Please specify.....              |

12. What are the infrastructure challenges that you face in the areas that you live? (Please select all that apply)

- |   |  |
|---|--|
| a. Lack of access to primary school           | e. Lack of easily accessible markets     |
| b. Lack of easily accessible secondary school | f. Difficulty in accessing grazing areas |
| c. Lack of healthcare for people              | g. Lack of close by water points         |
| d. Lack of healthcare for animals             |  |

13. What problems are you aware of in working animals in your region – now or in the last 5 years? (Please select all that apply)

- a. Foot/shoe problems
- b. Mouth/dental problems
- c. Eye problems
- d. Constipation
- e. Colic/abdominal pain/diarrhoea
- f. Joint or leg problems/lameness
- g. Skin problems
- h. Wounds
- i. Tetanus
- j. Road traffic accidents
- k. Parasites
- l. Breathing problems
- m. Infectious disease
- n. Sudden death without any previous problems
- o. Donkey skin trade
- i. Donkey theft
- ii. Financial challenges
- p. Other - Please describe.....

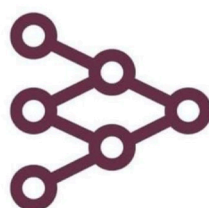
**Questions 14 and 15 are for Veterinarians, Technicians and CAHW's only:**

14. What is the biggest problem for veterinary services in your district? (Select all that apply)

- a. Insufficient medications
- b. Insufficient equipment
- c. Lack of qualified staff
- d. Insufficient training about working animals
- e. Other (please specify) .....

15. Which subject would be most useful for training owners and handlers of working animals in your district? (Select all that apply)

- a. Working animal welfare
- b. How to improve harnessing
- c. Infectious disease including EZL
- d. Foot care
- e. Nutrition
- f. Wound management
- g. Other: please specify.....



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